CARANX BARTHOLOMAEI AND RUBER COMPARED

Jordan and Evermann (1896, "Fishes of North and Middle America") use the criterion of depth to differentiate these two species, giving that of *bartholomaei* as 3.5 and of *ruber* as 2.8.

Small specimens of *bartholomaei* are certainly deeper and the species appears not to reach so large a size. Of the series of 36 individuals in the American Museum of Natural History examined, only one exceeds 140 mm. in length to the base of the caudal. In that one (from Cienfuegos market, Cuba), however, which measures 211 mm., the depth is 3.0. As a matter of fact, *Caranx ruber* is frequently as deep as this. So the criterion of depth will not hold.

An excellent criterion which does hold, however, may be found in the number of gill-rakers. The lower limb of the first gill arch bears 17 to 19 gill-rakers in 12 *bartholomaei,* ranging from 40 to 211 mm. in length, usually 19. Whereas in 5 *ruber,* ranging from 96 to 217 mm. in length it bears 31 to 33 gill-rakers.

There is a distinct difference in contour in these two fishes. The lower jaw is distinctly projecting in *ruber,* the lower outline of the head more slanting, less horizontal, the fish's lines more symmetrical. Differences in general color mentioned by Jordan and Evermann are, of course, not appreciable in alcoholic specimens, but certain markings are. The young of *bartholomaei* evidently have the habit of hiding in floating weed, and I have taken a specimen from sargassum mottled so as to match admirably the intricacies of that habitat. Though it does not usually persist so long, there are traces of this mottling (in an eye-bar, and above the anal fin) in one alcoholic specimen, 102 mm. long. On the other hand, there is one specimen only 49 mm. long which shows no

such traces whatever and likely had none in life. A mark in *ruber* which is conspicuous in our 5 alcoholic individuals from 96 to 217 mm. in length is a bold black stripe on the lower lobe of the caudal fin, likely a recognition mark.

Data on depth in *bartholomaei* (from North Carolina; Florida; Havana market, Cuba) follows to give an idea of the change with age. Lengths are to base of caudal. Fourteen specimens 35 (38) to 70 mm. long have depth 2.1 to 2.3 (average 2.22); 21 specimens 70 (71) to 140 (138) mm., 2. 3 to 2.4 (average 2.33). The material shows a distinct loss of depth between 35 and 70 mm., none between 70 and 140 mm. It is not yet necessary to consider the 211 mm. specimen a different fish or even an abnormal individual, though we can only explain it otherwise by a second period of loss of depth. The first period is probably coincident with a change of habits, such a second period may be coincident with another habit change, after which the species is less accessible to, and rare in collections. Data on other large specimens of *bartholomaei* would be of interest, chance of confusion with *ruber* to be avoided by counting gill-rakers. The 5 *ruber* (96 to 217 mm. from Porto Rico, Havana, Turks Id.) have depth (in length to base caudal) 2.8 to 3.2 (average 3.06), the two smallest (96 and 108) average 2.90, the three largest (191 to 217), 3.17.

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ON CARANX CRYSOS, ETC.

The fishes recognized as *Caranx pisquetus* (West Indies to Brazil) and *Caranx caballus* (San Diego, Calif. to Panama) appear to be indistinguishable from *Caranx crysos* (New York to Florida). The fewer scutes credited to *caballus* is a matter of individual variation. The most anterior scutes near the angle of the lateral line are small and poorly